



## Iron Furnaces

The Vesuvius Iron Furnace (abandoned stack above) was one of 46 charcoal iron furnaces located in the six county Hanging Rock Iron Region of southern Ohio. The furnaces produced iron from 1818 to 1916. By 1875, southeastern Ohio led the nation in iron production. Civil War armaments, pots, kettles, steel tires, train wheels, and other tools were made of iron from this region. The hulls for both the Monitor and Merrimack were fired from ore mined in this region.

Hanging Rock iron was noted for its rust and corrosion-resistant characteristics. A furnace would produce 8 to 12 tons of iron each day in the form of pig iron. Pig iron was then sold to manufacturers of other iron products.

Early predictions had boasted that the iron ore in the Hanging Rock region would produce iron for 2,700 years. But shortly after the Civil War, better quality ore was found elsewhere and the Hanging Rock seams required more expense to produce less iron so by the 1900's, most of the Hanging Rock furnaces had ceased operation.

### *Links for more general information on Furnaces:*

[http://www.oldindustry.org/OH\\_HTML/OhioIron.html](http://www.oldindustry.org/OH_HTML/OhioIron.html)  
<http://www.oldeforester.com/ironintr.htm>  
<http://www.irontonfurnaces.com/>

## Contact Us

Though what remains of the Iron Furnaces are in a variety of public and private ownerships, more information on the topic and on the Wayne National Forest is available from the Ironton District Office. Office hours are 8 - 4:30 Monday through Friday.

### **Ironton Ranger District**

6518 State Route 93  
 Pedro, OH 45659  
 Phone: 740-534-6500

Federal relay system for the deaf and hearing impaired: 1-800-877-8339  
**website: [www.fs.usda.gov/wayne](http://www.fs.usda.gov/wayne)**

### *Furnaces on Wayne National Forest:*

Cambria Furnace  
 Center Furnace - No stack exists  
 Etna Furnace  
 Pioneer Furnace  
 Vesuvius Furnace

### *Furnaces on Private Land:*

Buckhorn Furnace  
 Lagrange Furnace  
 Oak Ridge Furnace  
 Olive Furnace  
 Washington Furnace

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 and employer.*

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# Iron Furnaces in the Wayne National Forest



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United States Department of Agriculture



## History of Hanging Rock Iron Region -

The historic Hanging Rock Iron Region was approximately 100 miles long and 28 miles wide or 1,000 square miles stretching across a good portion of Ohio and extending into Kentucky and West Virginia. There were 46 charcoal iron furnaces built in Ohio, most between 1818 and 1873. For nearly a century, the region produced the finest quality iron in the United States.

In the early years, oxen hauled the iron by wagon from the furnaces to the shipping point. It took as many as 50 yoke of oxen to move the iron to the docks. Once loaded on river boats, the iron was taken to Cincinnati, Pittsburgh, and St. Louis.

It was said that during the War, the demand for iron and its ingredients like charcoal became so great that many iron masters would have the charcoal loaded before it had cooled, and occasionally the hot coals would set the wagons on fire on the way to the furnaces.

In 1849, at the cost of \$500,000, some of the iron furnace masters incorporated a railway system to link their furnaces to the Ohio River. It was the earliest railroad in the region. Known as the Iron Railroad, it began operating in 1851, servicing the furnaces along its 13-mile stretch from Ironton



*Detroit, Toledo and Ironton train ca. 1926.  
Henry Ford is third from left.*

*Photo courtesy of Lawrence Co. Historical Society*

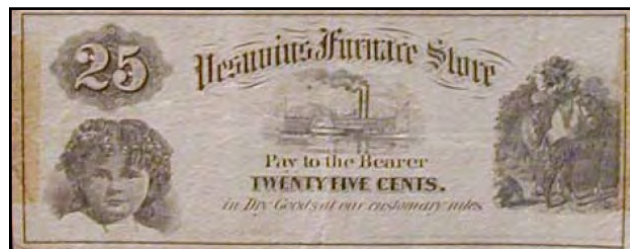


*A photo of the Hecla furnace operation, the furnace stack is just left of center.*

to Center Furnace. The town of Ironton sprang up around its southern terminus on the Ohio River. The railway system was later known as the Detroit, Toledo and Ironton and was owned by Henry Ford from 1900-1929 who bought it to connect his industrial ventures with the Ohio River.

### How were the furnaces used?

Viewed today, it's difficult to imagine that the furnace stacks were once only a small part of an elaborate industrial complex. The picture from Hecla Furnace (above) shows how the furnace was part of a community. Workers were housed on site in "company towns" that sprawled around the furnaces. The workers were normally paid in "scrip," (shown below) which was money printed by each



furnace and redeemable only at the Company Store. This kept the workers tied to the site since the scrip they earned had limited use.

To fuel the furnaces, the forests were repeatedly cut, and the wood converted to charcoal. Each ton of iron required 190 bushels of charcoal, three tons of iron ore, and 300 pounds of limestone. The three ingredients were poured in the top of the furnace and then the charcoal was ignited. Air was blown (hence blast furnace) into the firepot through openings called tuyeres on two

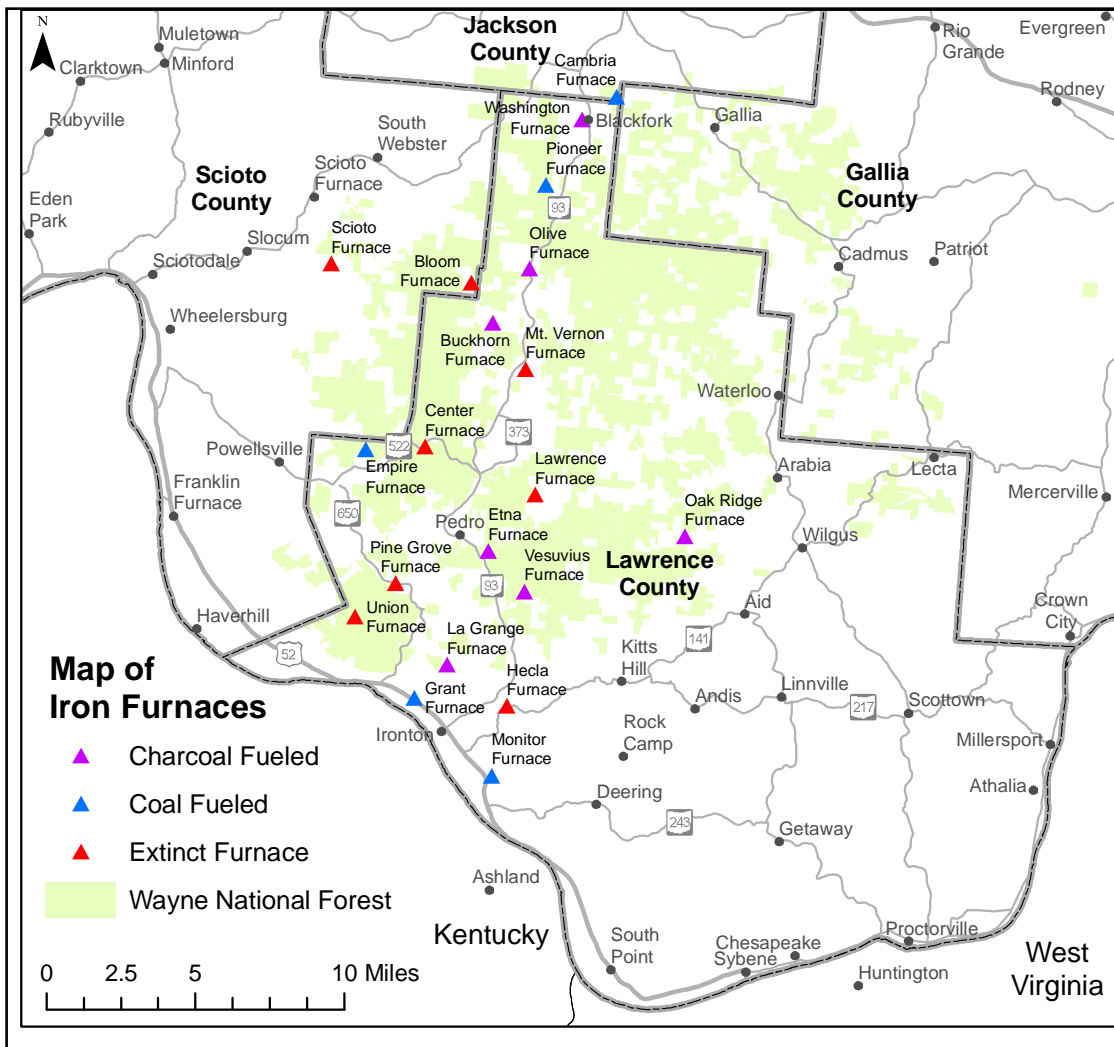
sides of the furnace just below the widest part (top) of the firepot. The two smaller inverted "Vs" were to allow steam out, cooler air in, and provide access to the firepot and tuyeres.

Once heated to the proper temperature the iron ore and limestone melted. Impurities in the mixture floated to the top and formed a glassy waste product called slag. The larger inverted V-shaped opening was where the molten iron ran out into the hearth, past the dam stone and then into the sow and on to the pig iron molds. The central trench was called the sow, the side trenches, pig molds. The names came from the similarity of appearance to piglets nursing on each side of a sow pig. After the iron ran out, the slag was drained and sent through a trench on the other side of the casting house. The molten iron then cooled and solidified.

As the quality of iron seams declined and the costs of production went up as the circle of denuded land required ever further hauls of wood for charcoal, the last furnace closed in 1916. Between 1900 and 1930, census records show a 40 percent drop in the area's population.

*Photo courtesy of Lawrence Co. Historical Society*





# Furnaces on Wayne NF Land



Vesuvius Furnace, 2007 (above)

## Vesuvius Furnace

The Vesuvius Furnace was built in 1833 and named for an Italian volcano. It became the first hot blast furnace in the region in 1837 and produced 10 tons of iron daily. Vesuvius "blew out" or closed in 1905. Only the rock chimney and a wall, built without benefit of mortar, remains. The company town of Vesuvius, now gone, was

## If you visit...

These furnaces are historic sites and are protected by law. They are unstable and fragile. **DO NOT CLIMB** on the rocks. It is also illegal to remove any artifacts, slag, or other by-products from the sites.

The furnaces are treasures from the past. Help us protect them. Our vision is to someday have an auto tour of the sites and further interpret these fascinating resources. **Keep in mind that you may not visit the furnaces on private land without permission.** They are included here only as points of interest to view from the road.

## Cambria Furnace



The Cambria Furnace is difficult to find or visit. It was built in 1854 and produced 12 tons of iron per day.

The owners of this furnace were sixty Welsh stockholders. They financially suffered in the Panic of 1857 and did not capitalize on the Civil War, when iron prices soared. The furnace closed in 1878. The furnace stack, shown at left, is in poor condition.



From the Amos Hawkins Collection

*Drawing of the front view of Vesuvius Furnace in operation.*

*The Vesuvius Furnace stack in 1920 (below) with the abandoned rail line.*

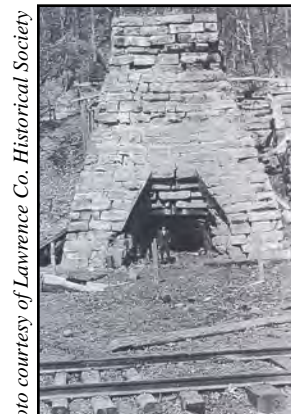


Photo courtesy of Lawrence Co. Historical Society

located several miles west of the Furnace.

The Furnace is now part of the Vesuvius Recreation Area and is on the National Register of Historic Places. Recognizing its historic value, a roof was added to the rock furnace in 1991 to protect the massive stonework and firebrick from further water damage.



# Pioneer Furnace

The Pioneer Iron Furnace (right and below) was built in 1856 and began operation the next year. It was acquired by the US Forest Service in 2007.

The Pioneer Furnace was the first in the region to use coal to manufacture pig iron. It produced 12 tons of iron daily and operated until the late 1870s.



*Center Furnace still standing. Photo above and below courtesy of Lawrence Co. Historical Society*



*Nannie Kelly Wright with her car.*

# Center Furnace

The Center Furnace is now only an archaeological site. No stack or stone remain but other evidence of the old site have been found. The site has been determined eligible for the National Register of Historic Places.

The Center Furnace was built in 1836 and produced 16 tons of iron per day. Nannie Kelly Wright (wife of the late Lindsey Kelly) bought Center Furnace in 1898, and assumed managerial duties in 1903. It is believed that Nannie Kelly Wright was one of the wealthiest women of her day and is noted as having been the only woman Iron Furnace Master in America.

Center Furnace was also at the northern end of the Iron Railroad, a legacy of John Campbell (a known abolitionist and founding father of Ironton). As the iron furnace industry began to decline, the surrounding area that provided raw materials for Center Furnace became increasingly utilized for its limestone. Eventually the demand for cement was greater than that of iron. The town that once revolved around iron became a prospering cement industry; thus evolving into the village of Superior which produced cement until the 1970's.



*The ruins of the Etna Furnace stack (right) are in poor condition. The Etna Furnace Church House (below right) is still in use.*



*Hauling charcoal to the furnace. Photo courtesy of Lawrence Co. Historical Society*



*Photo courtesy of Lawrence Co. Historical Society*

*Workers at the limestone quarry in Superior, 1915*

# Etna Furnace

Etna Furnace (aka Aetna Furnace) was built in 1832. The Etna Iron Works owned several furnaces, including Vesuvius, Big Etna in Ironton, Alice, Blance, and this site. The company reportedly owned approximately 16,000 acres of land around the Etna and Vesuvius furnaces. However, the Etna Iron Works suffered a series of financial setbacks in 1878 that probably resulted in the shutdown of the "Little Etna" facility. The Etna Furnace produced 16 tons of iron a day until it closed in 1887.